



**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In the **PATENT APPLICATION** of:

Reddy et al.

**Application No.:** 10/675,638

**Confirmation No.:** 6062

**Filed:** September 29, 2003

**For:** LOCATION BASED METHOD AND  
SYSTEM FOR WIRELESS MOBILE UNIT  
COMMUNICATION

**Group:** 2681

**Examiner:** Dai A. Phuong

**Our File:** I-2-0386.1US

**Date:** November 16, 2006

**DECLARATION UNDER 37 C.F.R. § 1.131**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Prabhakar R. Chitrapu, make the following declaration:

1. I am a named inventor of the above-identified patent application and co-inventor of the subject matter described and claimed therein.

2. Prior to September 11, 2002, my co-inventors and I conceived of an invention entitled LOCATION BASED METHOD AND SYSTEM FOR WIRELESS MOBILE UNIT COMMUNICATION (hereinafter "the present invention") as described and claimed in the above-identified patent application.

3. Prior to September 11, 2002, we prepared an Invention Disclosure Form and Invention Disclosures describing the present invention. True and correct

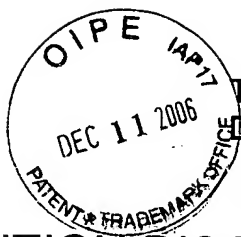
copies of the Invention Disclosure Form and Invention Disclosures are attached hereto as Exhibit A.

4. Each of the dates redacted from Exhibit A are prior to September 11, 2002.

5. The above-identified application is a non-provisional of Provisional Application No. 60/415,281 filed on October 1, 2002. Due diligence was exercised from the date prior to September 11, 2002 which the Invention Disclosure Form was prepared up to the filing date of Provisional Application No. 60/415,281 and the subsequent filing of the present application based thereon.

The undersigned hereby declares that all statement made herein are based upon his own knowledge and are true and that the statements were made with the knowledge that willful false statements will be punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize of the validity of the application or any patent issued thereon.

Prabhakar Chitrapu 11.15.06  
Prabhakar R. Chitrapu Date



This section for internal use only:

Date stamp

Disclosure number:

REDACTED

## INVENTION DISCLOSURE FORM

Send to:

InterDigital Communications Corporation  
Patent Administrator  
781 Third Avenue  
King of Prussia, PA 19406

This disclosure includes:

- ☒ IDC Inventor(s) Only  
☐ IDC & Non-IDC Inventor(s)

Attachments? ☒ Yes ☐ No

### INSTRUCTIONS

#### I. General

- Title of the Invention: Method and System for Providing Access Control in Hot Spot Wireless Communication Systems based on the location of the User
- Answer all questions. Use N/A when not applicable. Attach separate pages when answering sections III through IV.
- Sign and date each page and any additional pages that constitute the disclosure in ink. Write all given names in full when signing the Disclosure.
- Two witnesses must sign and date every page of the INV Disclosure and accompanying papers using the signature block on the bottom of each page. The witness should have read the INV Disclosure and understood the disclosed material prior to signing and should be of such background that doubt of his comprehension is unlikely to be raised at a later date. A co-inventor should not be a witness.

1.

INVENTOR	CO-INVENTOR, IF ANY
PERSONAL INFO: Mr <input checked="" type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Dr. <input type="checkbox"/>	PERSONAL INFO: Mr. <input type="checkbox"/> Mrs. <input type="checkbox"/> Ms. <input type="checkbox"/> Dr. <input checked="" type="checkbox"/>
FULL NAME Leonid Kazakevich	FULL NAME Prabhakar chitrapu
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Citizen of	Citizen of USA
COMPANY INFORMATION	COMPANY INFORMATION
Name: InterDigital Communication Corp.	Name:
Address: 781, Third Ave, King of prussia, PA - 19406	Address:
Tel. No.	Tel. No.

READ AND UNDERSTOOD BY:

Inventor (1):	Witness #1
Inventor (2):	Witness #2
Date:	Date:

SSN.	SSN. 171667366
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2.

WITNESS #1	WITNESS #2
Name	Name
Tel. No.	Tel. No.
Date	Date
Address	Address

## II. Conception

- When did you first begin to work on the invention? **REDACTED**
- Did any work concerning the invention arise in the course of any contract?  
if yes, identify: NO
- Is further development of your invention now in progress or scheduled? ☐ YES ☒ NO
- Has any aspect of this invention been published, been presented at a scientific meeting or otherwise disseminated? If yes, please identify and list dates (**Dates are important**) If published, list the date they are recorded on microfilm or in a library.
- Are there any plans to publish or otherwise disseminate any aspect of this invention in the future? ☐ YES ☒ NO If yes, please identify and list dates.

**NOTE:** If the invention has not yet been published or otherwise disseminated, IDC patent counsel should be notify immediately of any contemplated releases.

## III. Description of the invention

Describe specifically what you consider to be your invention, as distinguished from the prior art. The description may reference a separate document (copy of a report, excerpt from a grant application, or the like) attached hereto. The description should include the following:

- The problem solved by the invention? See Attachment
- The advantages of your invention over the prior work? See Attachment
- The parts (steps) that make up the invention, in its best (preferred) form?
- The parts that are new to this invention (in form or usage), and those that are old (conventional, used in the expected way)?
- The way the parts interact to make the invention work?
- Whether the part, (or its form or interconnection) is *ESSENTIAL* to the invention. For example, ask yourself, "If this part were left out, or changed, would the remaining device still be my invention?" Or, "If this part were changed or left out, would the invention still work? This may include any critical limitations such as angle, temperature, size, etc.

READ AND UNDERSTOOD BY:	
Inventor (1):	Witness #1
Inventor (2)	Witness #2
Date:	Date:

- g. Provide labeled sketches to detail your invention. Be sure all essential parts are shown on the sketch, and try not to include extraneous details. Measurements are not required, unless they are essential to the operation of the invention.

#### **IV. Background Information**

- a. What is the problem solved by your invention? See Attachment
- b. How was the function of your invention performed by the prior work? See Attachment
- c. What are the disadvantages of the prior work? See Attachment

#### **V. Prior Art**

Attach a copy and citation of all publications, patents, etc. which are known to you, which relate to your invention, and which would be important to consider in understanding how your invention differs from prior work.

#### **VI. Alternatives**

You have described the best way to build (perform) your invention. Now consider the alternatives.

- a. Is there any other way to perform your invention?
- b. In what ways could the parts (steps) be changed or equivalent parts substituted without changing the basic invention?
- c. Is there a generic description for any of the parts you listed (i.e. "fastener" instead of "Machine Screw", or "plastic" instead of "polypropylene")?
- d. Could the functions of any of the parts be changed, combined, eliminated?
- e. What could be added to make the invention work better?
- f. What could be left out?

**Are you providing attachments with this disclosure ☒YES ☐NO**

**If you have any questions regarding this disclosure please contact:**

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READ AND UNDERSTOOD BY:	
Inventor (1):	Witness #1
Inventor (2)	Witness #2
Date:	Date:

# **Method and System for Providing Access Control in Hot Spot Wireless Communication Systems based on the location of the User**

Leonid Kazakevich & Prabhakar Chitrapu

**REDACTED**

## **BASIC IDEA OF INNOVATION**

Hot Spot Wireless Communication systems are typically based on technologies such as WLANs and TDD and are being deployed in areas such as Airports etc. Access to these Networks is normally achieved by User Authentication procedures. In this disclosure, we propose an additional access control scheme based on the location of the user. This additional scheme may be used by itself or in conjunction with other access control schemes.

The access control scheme proposed here is based on the location of the user (or user equipment). The location of the user is determined by the user equipment and communicated to the network during the access procedure or by the network itself. Hybrid methods are also possible. The Hot Spot Network contains one or more databases with information characterizing certain areas as being valid Access Areas and Non-Access Areas. When a user attempts to access the network, the network analyzes the location of the user and denies access if the user is in a Non-Access Area. If the user is in an Access Area, the access procedure continues according to normal procedures.

The Location based Access Control method may be invoked either at the beginning of an access procedure or at anytime during the user session at the discretion of the network.

The above described location based access control may be used to confine Hot Spot services to specific zones in a Hot Spot area, such as an Executive Lounge in an airport.

## **Potential Claims**

1. A Hot Spot Wireless Communication System, such as a WLAN or TDD-based Hot Spot, where the location of the User Equipment is determined by the network either by itself, or in conjunction with information provided by the user equipment, where access to the hot spot network is controlled by the location of the user.
2. A Hot Spot Wireless Communication System where special service zones are created based on the geo-coordinates of the desired service zone.

# **Method and System for Optimizing Throughput based on the location of the User in a Hot Spot Wireless Communication System**

Gautam Reddy & Prabhakar Chitrapu

**REDACTED**

## **BASIC IDEA OF INNOVATION**

The basic idea of the innovation is that the serving network keeps track of the throughput to a mobile based on the location of the mobile. This information is used in advising the Users to move to a location where optimal throughput is achieved.

The Mobiles are GPS enabled and update the location to the mobile periodically. The serving network also keeps a database of the best available locations that have the best throughput. The mobile based on its location can request the nearest location where it could have a better throughput.

## **Potential Claims**

3. A Hot Spot Wireless Communication System, such as a WLAN or TDD-based Hot Spot, where the User Equipment is GPS enabled and where the User Equipment requests the Network for an Optimum Throughput location, and where the Network replies with a set of Optimum locations which are near the location of the User.
4. The same as above, where the Network determines the location of the User Equipment and automatically (without being requested by the User) advises the User to move to a location in a set of locations determined by Optimum Throughput considerations.
5. As in above claims, where in the User Equipment is enabled with 'map information', on which the optimum locations are displayed.
6. A Hot Spot Wireless Communication System, where the throughput and location information is collected, stored and used for administrative purpose while planning WLAN. For example, more radio resources may be allocated in those areas where large throughput can be achieved.

## **Method and System for providing Controlled Peer-to-Peer Communication Services among Multimode WLAN user equipments**

### **BASIC IDEA OF INNOVATION**

As WLANs are gaining popularity, multimode user equipments that include WLAN modems are expected to proliferate. Such devices offer new communication service possibilities as well as present new challenges to operators in order to control and bill the users for the communication services.

802.11 family of standards supports two modes of operation for the WLAN. They are the Ad Hoc mode and the Infrastructure mode. In the Infrastructure mode, all traffic to and from Users passes through an Infrastructure entity called the Access Point, so that communication services may be controlled and billed. On the other hand, in the Ad Hoc mode, user equipments within the radio range of each other can communicate with each other directly, without the intervention of any infrastructure entities.

In this invention, we propose the use of ad-hoc mode of communication for future multimode communication devices that include WLAN modems. These include Cellular Phones, PDAs and other portable wireless equipment also equipped with WLAN modems. We propose to use such devices to communicate directly with each other using WLAN modems configured in the ad-hoc mode for applications such as transferring phone books from one user equipment to another, for exchanging data etc.

The second part of this invention rests on the observation that uncontrolled use of peer-to-peer communications may adversely affect the business model of the WLAN operator. Furthermore, it may also pose a security threat to the communication network, as malicious users may flood the communication area with unwanted data transmissions, thereby preventing legitimate use of the communication resources.

Therefore, we propose a method for limiting the multimode WLAN-devices in their ability to conduct peer-to-peer communications. The limitation could be in terms of the amount, duration and type of data traffic involved. Secondly, we propose a method by which the WLAN Access Point (Infrastructure Entity) can control the WLAN modem of a multimode WLAN-device in order to limit or terminate the peer-to-peer communication session. This method is also extended to the case of single-mode WLAN modems.

### **Potential Claims**

1. A method by which more than one multimode user equipment that includes a WLAN device can establish peer-to-peer communications among themselves.
2. A method as in claim 1, where the peer-to-peer communications are used to transfer phone books from one user equipment to another.
3. A method as in claim 1, where the user equipments are cellular phones with WLAN modems, or PDAs with WLAN modems or portable electronic gaming devices with WLAN modems.
4. A method by which multimode WLAN-devices are allowed to establish limited amounts of peer-to-peer communications.
5. A method by which a WLAN-network can control a multimode WLAN-device in the amount, duration and type of peer-to-peer communication that it is allowed to conduct.
6. A method by which a WLAN-network can control a single-mode WLAN-device in the amount, duration and type of peer-to-peer communication that it is allowed to conduct.
7. A method as in claim 5 or 6, wherein the WLAN network can limit or terminate a communication session of a user equipment with a WLAN modem.



# Method and System for Optimizing Throughput based on the location of the User in a Hot Spot Wireless Communication System

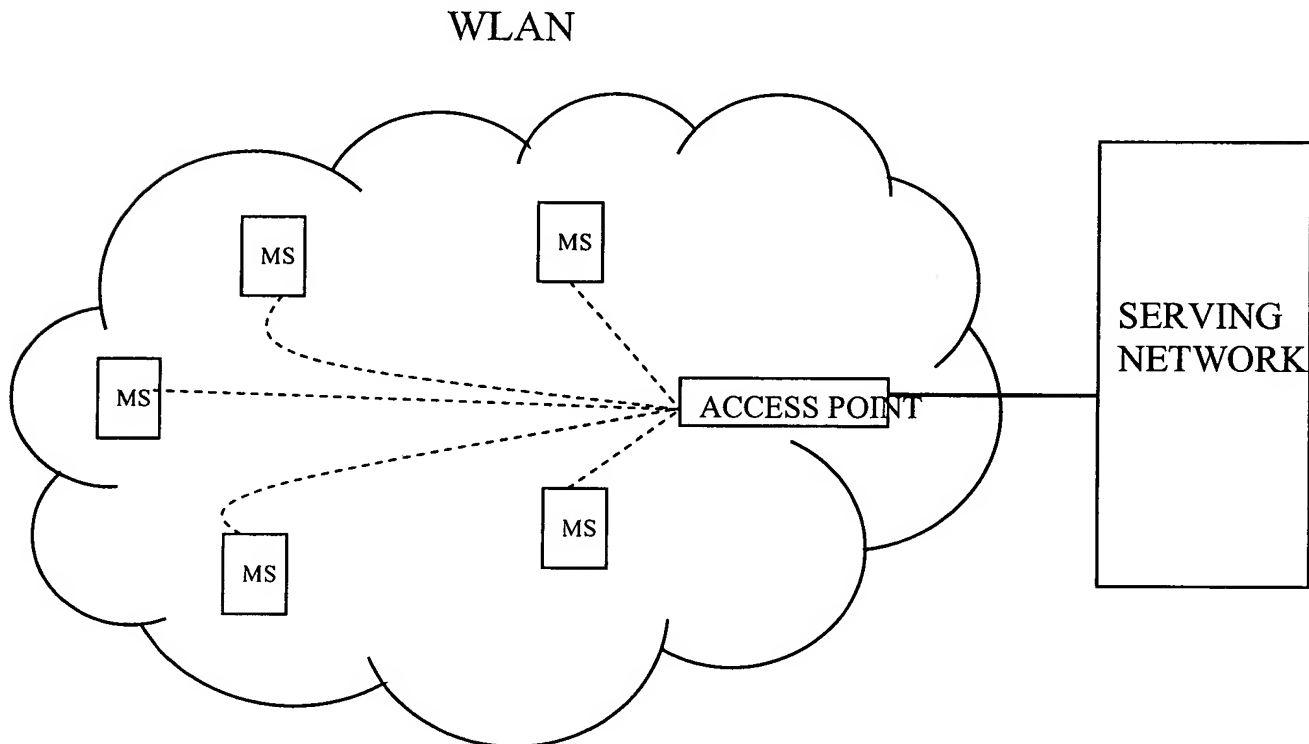
Gautam Reddy & Prabhakar Chitrapu

REDACTED

## BASIC IDEA OF INNOVATION

The basic idea of the innovation is that the serving network keeps track of the throughput to a mobile based on the location of the mobile. This information is used in advising the Users to move to a location where optimal throughput is achieved.

The Mobiles are GPS enabled and update the location to the mobile periodically. The serving network also keeps a database of the best available locations that have the best throughput. The mobile based on its location can request the nearest location where it could have a better through put.



MS – Mobile stations are GPS enabled

## Potential Claims

1. A Hot Spot Wireless Communication System, such as a WLAN or TDD-based Hot Spot, where the User Equipment is GPS enabled and where the User Equipment requests the Network for an Optimum Throughput location, and where the Network replies with a set of Optimum locations which are near the location of the User.
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